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Control of Avian Influenza: Philosophy and Perspectives on Behalf of Migratory Birds

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Introduction

Aquatic birds are considered the primary reservoir for influenza A viruses (Nettles et al., 1987). However, there is little concern about avian influenza among conservation agencies responsible for the welfare of those species. In contrast, the poultry industry has great concern about avian influenza and view aquatic birds as a source for infection of poultry flocks. In some instances, differences in these perspectives created conflict between conservation agencies and the poultry industry. I speak on behalf of migratory birds, but philosophy and perspectives offered are intended to be helpful to the poultry industry in their efforts to combat avian influenza.

Migratory Bird Stewardship and Economics

Migratory birds are a natural resource with great esthetic and economic values. Figures from the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation disclose that $638 million was spent in the United States during 1980 for hunting of migratory birds. Approximately $33 billion was spent primarily for wildlife-associated recreation that year, including nonconsumptive wildlife activities such as observing and photographing wildlife (Fish and Wildlife Service and Bureau of the Census, 1982). Other figures of a decade later state that waterfowl hunting is a $2 billion annual activity in Canada and the United States (North American Waterfowl Management Plan Committee, 1991). By any standards, migratory birds significantly contribute to the nation's economy. Consumptive and non- consumptive users of the nation's migratory birds collectively support increased migratory bird populations, albeit for different purposes.

Stewardship of migratory birds in the United States is the responsibility of the Fish and Wildlife Service (FWS), U.S. Department of the Interior. International collaboration for the conservation of migratory birds was facilitated by the 1916 passage of the Migratory Bird Treaty Act.

Specific treaties under that act have established formal cooperative efforts for the conservation of migratory birds between the United States and Great Britain on behalf of Canada (1916), Mexico (1936), Japan (1972), and the former Union of Soviet Socialist Republics (1976).

Enhancement of Waterfowl Populations

Waterfowl are a major component of the migratory bird resource. Worldwide, there are 147 distinct forms of wild ducks, geese, and swans (Todd, 1979). Ducks are the predominant waterfowl group and comprise 36 of the 45 native species of wild waterfowl in the continental United States and Canada. Another 5 waterfowl species regularly visit North America from Eurasian breeding grounds (Bellrose, 1976). Declining waterfowl populations have stimulated numerous actions to reverse current trends. In 1986, the United States and Canada signed the North American Waterfowl Management Plan establishing a 15-year framework for international cooperation. The plan's emphasis is creating and restoring wetlands at a projected cost of $1.5 billion for just the habitat protection component. Restoring duck populations to their 1970s levels of 62 million breeders, producing a fall flight of 100 million birds, is a major goal (North American Waterfowl Management Plan Committee, 1991). Joint Venture partnerships across the continent involving agreements with private landowners are an integral part of the plan. These efforts are aided by the Food, Agriculture, Conservation and Trade Act of 1990 (Farm Bill) and associated Wetlands Reserve Program and Conservation Reserve Program; the Coastal Wetland Planning, Protection and Restoration Act; and Canada's Green Plan.

The continued decline of North American waterfowl populations has also stimulated a growing interest in the United States in large scale releases of captive-reared mallards (Anas platyrhynchos) to supplement sport hunting opportunities. The Eastern Shore of Maryland, primarily Dorchester County, has been a focal point for that activity. Captive-reared mallards are released on private, licensed areas referred to as Regulated Shooting Areas. The number of such areas in Dorchester County increased from 12 to 107 in the past eight years. Over 1.2 million captive-reared mallards were released in those areas, which have become the fifth-largest industry in the county

(Phillips, 1991). Interest in developing similar programs in other prime waterfowl hunting areas of the United States is gaining momentum.

Waterfowl Movement Patterns

Because of the high prevalence of influenza viruses in migratory waterfowl (Hinshaw, 1987), the described creation of habitat and release of mallards are of relevance to the epizootiology of avian influenza. Migratory waterfowl travel along geographic corridors referred to as flyways. Movement patterns in those flyways differ with species and time of year. Movement patterns are also strongly linked to habitat availability and the timing of major migrational movements is generally associated with seasonal changes in weather. The creation and enhancement of waterfowl habitat will alter current waterfowl distributions in time and space, thereby altering opportunities for exchange of influenza viruses among and between species and populations.

Large scale release of captive-reared mallards for hunting in Dorchester County resulted in distributions of mallards in time and space that differ from those of their wild conspecifics. The movement patterns of captive-reared mallards also differ from those of wild mallards, thereby, presenting different than previous opportunities for the exchange of influenza viruses. The rearing and maintenance of captive-reared mallards is more closely associated with domestic poultry than with wild waterfowl. However, a major variance between poultry operations and mallard operations is the general absence of disease surveillance and meaningful regulations for disease prevention and control for captive-reared mallards.

Role of the National Wildlife Health Research Center

In contrast to poultry operations, prevention and control of wildlife disease are embryonic at best, non-existent in many situations, and often uncoordinated. The National Wildlife Health Research Center became a FWS entity in January 1975 in response to the disastrous 1973 outbreak of duck plague at the Lake Andes National Wildlife Refuge in South Dakota (Friend and Pearson, 1973). The center's role is to provide FWS with internal capabilities to combat disease in free-ranging wildlife under agency stewardship. The specific mission is:

1. Determine the effect of disease on wildlife under FWS stewardship;
2. Identify effective means for disease prevention wherever possible; and
3. Significantly reduce wildlife losses when disease erupts.

The Center is the only entity of FWS with responsibility for addressing matters in wildlife disease. Diseases of fishes are addressed by other FWS centers and programs. Although small in size, the center conducts the largest and most comprehensive program ever developed to combat disease problems of free-ranging wildlife populations. The staff of approximately 65 occupies two major buildings with adequate biocontainment for all but exotic disease agents. A proposed third and final building will accommodate further expansion of the program and more staff.

The center's staff aggressively pursue a philosophy that disease can be prevented and controlled. Fiscal and personnel resource allocations for disease investigations are generally for diseases such as avian botulism and avian cholera because of the frequency of outbreaks and high fatalities. There is little incentive to address avian influenza except as a special issue.

Control of Avian Influenza

Avian influenza became a special issue in attempts to develop the Patoka River National Wildlife Refuge. Concerns expressed by the Indiana poultry industry resulted in FWS convening a special task force to evaluate whether the proposed refuge would significantly increase disease risks for domestic turkey operations in the area. Several members of the current symposium audience served on that task force. Task force findings allowed refuge development to continue.

Response by FWS to the Patoka River controversy illustrates agency sensitivity to disease issues of migratory birds with possible consequences for domestic poultry operations. That response was also consistent with FWS philosophy and policy to be a <u>good neighbor</u> in managing the habitat base and fishes and wildlife under agency stewardship. Although it does not place avian influenza high on a priority list of research needs, FWS is likely to be

responsive in assisting others combat a major outbreak of avian influenza, including associated investigations in migratory birds.

Involvement of FWS in avian influenza outbreaks with a migratory bird component is advantageous. FWS is a primary source of information and technical expertise that is relevant to epizootiological investigations of avian influenza and is also the permit issuing agency for possession and take of migratory birds (including parts thereof). The FWS Migratory Bird Banding Laboratory has an extensive data base on movement patterns and survival data for specific avian species, populations, and subpopulations. Many FWS personnel are experts in bird biology and well trained in capture and marking techniques. In addition, FWS has equipment and facilities that can be of value in combatting and investigating avian influenza outbreaks. Diagnostic support, tight isolation for animal containment at the National Wildlife Health Research Center, portable incinerators, and a substantial compliment of individuals experienced in field investigations of wildlife diseases are examples of potential assistance.

Obtaining FWS assistance in a timely manner is best accomplished by previous arrangements rather than crisis response. Negotiated agreements between officials in the U.S. Department of Agriculture and FWS, which supplement existing interagency agreements, is a logical starting point. In addition, independent efforts to expand existing interactions between the Emergency Disease Programs and the National Wildlife Health Research Center could be beneficial in preparing for future outbreaks of highly pathogenic avian influenza.

Conclusion

This presentation addressed control of avian influenza in an oblique manner to illustrate several relevant points. First and foremost is the underlying reality that perspectives towards disease control in animals are motivated by economic, humane, anthropogenic, and regulatory factors. With rare exception, avian influenza has not caused morbidity or mortality in wild birds. Therefore, one should not expect conservation agencies empowered as stewards of free-ranging birds to have the same perspectives towards avian

influenza as the domestic poultry industry and the animal disease programs that serve the industry.

Time was spent at the beginning of my presentation to establish that wildlife, and particularly migratory birds, have great public values that significantly contribute to the nation's economy. The purpose of highlighting the economic values of migratory birds, and the programs devoted to enhancing migratory bird populations was to illustrate that poultry do not necessarily have priority over migratory birds, even on the basis of economics. Therefore, it would be erroneous to assume that avian influenza linkages between migratory birds and poultry could easily be used to gain support for actions to benefit poultry operations with significant costs for the migratory bird resource.

The brief comments about the number of waterfowl species, movement patterns, and species interactions were intended to increase sensitivity to the biological complexity of waterfowl as a group. Epizootiological studies of avian influenza often failed to incorporate migratory bird biology at population and subpopulation levels and generally did not deal with wild bird species interactions in time and space. Attention was given to large scale release of captive-reared mallards because of the potential for this activity to add a new dimension to avian influenza epizootiology. The National Wildlife Health Research Center was featured to provide background on FWS capability for addressing disease problems involving migratory birds and other wildlife. All of the proceeding was background to provide understanding of the perspectives underlying my comments in representing FWS on control philosophy for avian influenza.

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